REMARKS/ARGUMENTS

Reconsideration of this application and entry of the foregoing amendments are respectfully requested.

The claims have been revised to define the invention with additional clarity. New claim 29 has been added. The claims as presented are fully supported by an enabling disclosure.

Claim 5 stands objected to as depending on cancelled claim 3. Claim 5 has been amended to depend from claim 1. Withdrawal of the objection is requested.

Claims 1, 2, 4 and 5 stand rejected under 35 USC 112, first paragraph, as allegedly lacking written description. Withdrawal of the rejection is submitted to be in order for the reasons that follow.

The Examiner contends that the claims as amended add new matter since the application as originally filed does not support the proviso that when two of the groups R2 to R5 are ether, they can not both be C1-C3 n-alkyl.

Withdrawal of the rejection is submitted to be in order in view of the above-noted claim revision which conforms with the original claim language. Reconsideration is requested.

Claims 1, 2, 4, 25, 26 and 28 stand rejected under 103(a) as being obvious over Papageorgiou et al (WO 00/42057). Withdrawal of the rejection is submitted to be in order for the reasons that follow.

The Examiner states that Papageorgiou et al discloses monosaccharide building blocks derived from 5 or 6-carbon pyranose and furanose sugars and aminosugars

having an anomeric leaving group that can be a thioalkyl group, and in which the remaining hydroxyl and amino groups are protected by orthogonal protecting groups (p4m lines 14-31). The Examiner specifically refers to the examples wherein a protected 2-amino-2-deoxysugar is synthesized by a route that involves intermediates having a combination of protected –OR groups and unprotected –OH groups (p14 Example 2, compounds 3 and 4; p24 Example 5 compounds 22 and 23). The Examiner acknowledges that Papageorgiou et al does not specifically exemplify a compound having the specific protecting groups recited in claim 1 and also having one or two free hydroxyl groups.

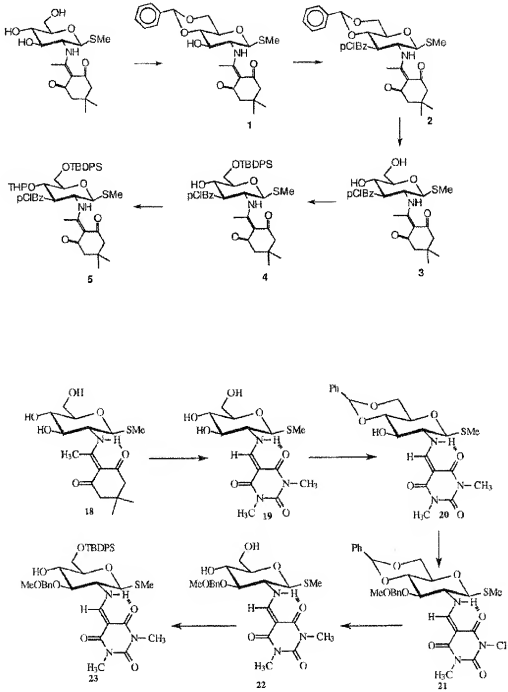
Papageorgiou et al provides collections of orthogonally-protected monosaccharides as universal building blocks for the synthesis of glycoconjugates. These protecting groups are removable in any order and include groups that are labile to acidic and basic conditions.

The Examiner has correctly identified the extent of the disclosure in Papergeorgiou et al when referring to Examples 2 and 5 and noting that Papergeorgiou et al refers to intermediates involving **protecting groups**. However, the Examiner's reference to the compounds of the instant invention as having "*specific protecting groups*" is incorrect because the instant invention is not related to protecting groups and this misinterpretation of the subject matter of the instant invention has led the Examiner to an incorrect analysis and conclusion as regards obviousness.

The instant invention provides stable compounds that have potential drug-like properties. The compounds comprise a monosaccharide scaffold particularly comprising an oxygen or sulphur atom at the anomeric center, at least one N(Y)Z group at R2-R5,

and only one of R4 and R5 is hydroxyl. These compounds are based around a monosaccharide scaffold comprising groups that are specifically designed such that they are not readily removable, in contrast to the teachings of Papageorgiou et al.

Papageorgiou et al, in Examples 2 and 5, describes the preparation of "Orthogonally Protected Building Blocks" (see below). In Example 2, compounds 3 and 4 relate to a **benzoyl** ester type protecting group, *BzpCl* at the three position. Protecting groups of this nature, i.e., ester type groups, clearly fall outside the scope of the instant invention. Ester groups are known to be labile both under biological conditions and under basic conditions, making these compounds unsuitable as potential drug-like candidates. Furthermore, it is not apparent how a person of ordinary skill could prepare a compound of the instant invention as a matter of routine from compound (3) of Papageorgiou et al. The preparation of compounds according to the instant invention following Papageorgiou et al would involve multiple steps that would be undesirable in the art of drug discovery. Moreover, the *Dde* type protecting groups as exemplified in Papageorgiou et al are excluded from the instant invention.



Applicants respectfully submit that the Examiner has relied on the benefit of hindsight in reaching the conclusion that it would have been obvious to one of ordinary

skill in the art at the time of the invention to make the compounds of the instant invention based on the teachings of Papageorgiou et al. Papageorgiou et al does not teach the preparation of compounds of the instant invention wherein one of R4 or R5 is hydroxyl. Furthermore, Papageorgiou et al would not have motivated the skilled person to attempt to prepare compounds that did not have labile moieties, since Papageorgiou et al is directed to orthogonally protected building blocks.

Applicants have identified difficulties in the art and have provided a practical solution related to compounds as defined in claim 1. These compounds possess advantages over the prior art compounds, as discussed above. The combined effect of the introduction of amine groups together with at least one free hydroxyl group at R4 and R5 on a monosaccharide scaffold provides advantages over the prior art not recognized by Papageorgiou et al.

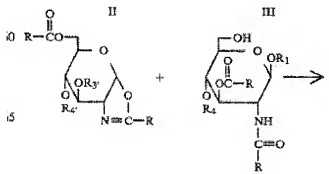
The Examiner appears to contend that it would have been possible to construct a theoretical compound falling within scope the claims of the instant invention by selecting from the protecting groups listed in Papageorgiou et al. Applicants respectfully disagree with this assertion. As stated above, Papageorgiou et al is directed to orthogonally protected monosaccharides – that is, every protecting group must be removable in the presence of all of the remaining groups in any order desired by the practitioner. Therefore, the teachings of Papageorgiou et al would not have made the entire world of protecting groups available to the person skilled in the art, but rather a subset that fulfils the requirements of orthogonality. Papageorgiou et al would not have provided any motivation to explore beyond these limits, much less would it have provided direction to the instant invention.

Withdrawal of the rejection is requested.

Claims 1, 2, 4 and 25 stand rejected under 103(a) as being obvious over Anderson et al (US 4495346). Withdrawal of the rejection is in order for the reasons that follow.

The instant invention provides stable compounds that have potential drug-like properties. These compounds are based around a monosaccharide scaffold comprising groups that are not designed to be removed as protecting groups, in contrast to the teachings of Anderson et al.

The Examiner contends that Anderson et al discloses a method of making a disaccharide utilizing a monosaccharide building block (labelled as III; column 1) having a structure that overlaps with the instant invention. Structure III as shown below is used in the coupling reaction to synthesize the disaccharide IV as shown in column 2.



Compound III comprises group OR_1 at the anomeric centre wherein R_1 is H or a phosphoryl group; C-2 comprises NHCOR, preferably palmitamido; **C-3 comprises**

OCOR (ester), preferably O-palmitoyl; and C-4 is OR_4, preferably OH or OCOR. These compounds relate to OCOR, i.e., ester moieties at C-3.

These compounds do not fall within the scope of the instant invention. The strategy of designing and placement of groups around the monosaccharide scaffold is different from that of Anderson et al. Anderson et al employs esters (i.e., removable protecting groups in the monosaccharide) that are suitable for the synthesis of the desired disaccharide based on a different synthetic strategy when compared to the instant invention which does not define esters.

Thus, the labile ester protecting groups as taught by Anderson et al fall outside the scope of the instant invention and there would have been no motivation for the person of ordinary skill in the art to substitute these labile ester groups with the more stable groups of the instant invention.

Therefore, the Examiner's assertion that the monosaccharide building block (labelled as III; column 1) of Anderson et al has a structure that overlaps with the instant invention is incorrect because the instant invention does not define ester groups as a substituent on the monosaccharide scaffold. This misinterpretation of the subject matter of the instant invention has led the Examiner to an incorrect analysis and conclusion as regards obviousness.

Furthermore, the Examiner appears to be attempting to rely on Anderson et al as teaching a compound wherein *R* is a *C7-C9 alkyl*. Applicants submit that the Examiner has incorrectly identified the ester group in Anderson et al as corresponding to the ether group comprising the alkyl groups in the instant invention. As discussed previously, the

chemistry related to the labile ester groups is distinct from the more stable ether groups which are regarded in the art as being more suitable as drug candidates.

In view of the above, withdrawal of this rejection is requested.

Applicants offer the following further comments as regards the art previously cited by the Examiner.

The Examiner indicates in the Office Action that Applicants' prior amendments were found to be persuasive to remove the rejection of claims 1, 2, 4, 25 and 26 under 103(a) as obvious over *Sas et al*, "*as the base claim has been amended to exclude compositions containing two dissimilar C1-C3 alkyl groups at positions R2 and R3, for example methyl and ethyl*".

Applicants direct the Examiner's attention to the fact that Sas does not teach the preparation of compounds having **any** two dissimilar ethers at R2 and R3. It will be clear from Applicants' previous submission that *Sas* does not teach one of ordinary skill in the art how to introduce two different groups at R2 and R3. The reaction scheme and the reagents used in Sas would not have enabled the person of ordinary skill to prepare compounds with two different alkyl groups at R2 and R3, regardless of the length of the carbon chain. Furthermore, the teachings of Sas would not have motivated the person of ordinary skill to prepare compounds containing two different alkyl groups at R2 and R3.

Applicants submit that Sas would not have rendered the presently claimed invention obvious.

The Examiner has indicated in the Office Action that Applicants' amendments have been found to be persuasive to remove the rejection of claims 1, 2, 4, 25 and 26

under 103(a) as obvious over Johnson et al in view of Carey et al, as the synthetic scheme of Johnson et al is seen to be sufficiently complex that arbitrary substitution of protecting groups would not have been expected to yield a suitable intermediate for this scheme.

Applicants concur with the Examiner's remarks and submit that the invention as presently claimed would not have been obvious over this combination of teachings.

The Examiner has acknowledged in the Office Action that Applicants' amendments have been found to be persuasive to remove the rejection of claims 1, 2, 4, 25 and 26 under 103(a) as obvious over Fukase et al in view of Carey et al, as the synthetic scheme of Fukase et al is seen to be sufficiently complex that arbitrary substitution of protecting groups would not be expected to yield a suitable intermediate for this scheme.

Applicants concur with the Examiner's remarks and submit that the invention as presently claimed would not have been obvious over this combination of teachings.

Claims 1, 2 and 25-27 stand provisionally rejected as allegedly representing obviousness-type double patenting over claims 16-21 of copending Application No 10/419070 ('070).

The Examiner contends that claim 16 and claims depending therefrom are drawn to a range of compounds having a structure that falls within the limits of instant claims 1, 2 and 5.

Applicants respectfully disagree. '070 discloses muramyl derivatives wherein R4 and R5 are both hydrogen, i.e., C-4 and C-6 contain both hydroxyl groups. According to

the instant invention as presently claimed, only one of R4 and R5 may be hydroxyl. Withdrawal of this rejection is, therefore, requested.

Claims 1, 2, 4 and 25-27 stand provisionally rejected as allegedly representing obviousness-type double patenting over claims 14-18 of copending Application No 10/813,737 ('737). Presumably, the copending Application intended was 11/813,737.

Applicants note the provisional nature of this rejection and direct attention to the fact that US 11/813,737 has a later priority date than the instant application.

This application is submitted to be in condition for allowance and a Notice to that effect is requested.

Respectfully submitted,

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